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October 17, 1997

VIA MESSENGER
Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W.
Washington, D.C. 20554

Re: Ex Parte Presentation
CC Docket 94-102

Dear Mr. Caton:

On behalf of KSI Inc. ("KSI") and pursuant to Section 1.1206(a) of the Commission's Rules, this will constitute notice that on October 16, 1997, Charles J. Hinkle, Jr. and John Maloney of KSI and Robert B. Kelly of Kelly & Povich, P.C., counsel to KSI, met with John Cimko, Jr., Ronald Netro, Nancy Boocker and Won Kim of the Policy Division of the Wireless Telecommunications Bureau regarding the Further Notice of Proposed Rule Making in the above-referenced Docket. The parties discussed the matters raised in KSI's Comments in the subject proceeding. In addition, copies of the attached material were distributed and discussed at the meeting.

Two copies of this notice are submitted herewith pursuant to Section 1.1206(a)(1) of the Rules.

Should there be any questions on this matter, kindly communicate with this office.

Sincerely,

Robert B. Kelly

cc: John Cimko, Jr.
Ronald Netro
Nancy Boocker
Won Kim

E911 LOCATION-ACCURACY REQUIREMENTS

October 16, 1997

Specification Clarity

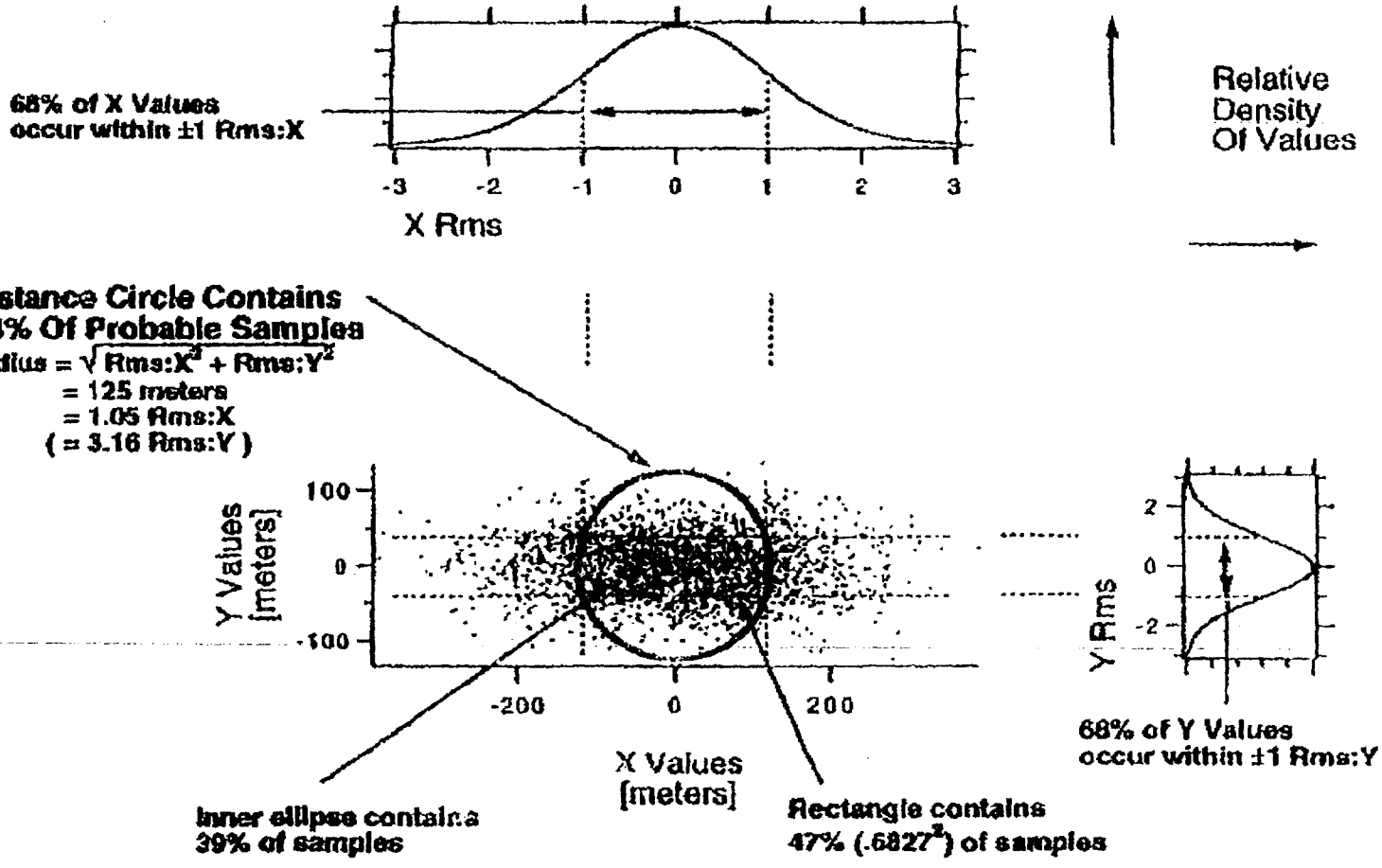
- **Final Rules (Appendix C) of the Report and Order 96-264 are clear in their specification of the accuracy requirement as a root-mean-squared measure**
  - **Ambiguity enters only from descriptions approximating the statistical percentage of the RMS containment as 67%**
    - **Suggested by the Consensus Agreement**

System Independent Accuracy

Accuracy specified as a RMS "radius" does not imply that the localization system must be configured to produce estimates with circularly symmetric statistical error distributions

- **Two-dimensional distributions are typically elliptical, and are dependent on system configuration and operational conditions**

TWO-DIMENSIONAL, NORMAL PROBABILITIES
When Rms:Y = 1/3 Rms:X



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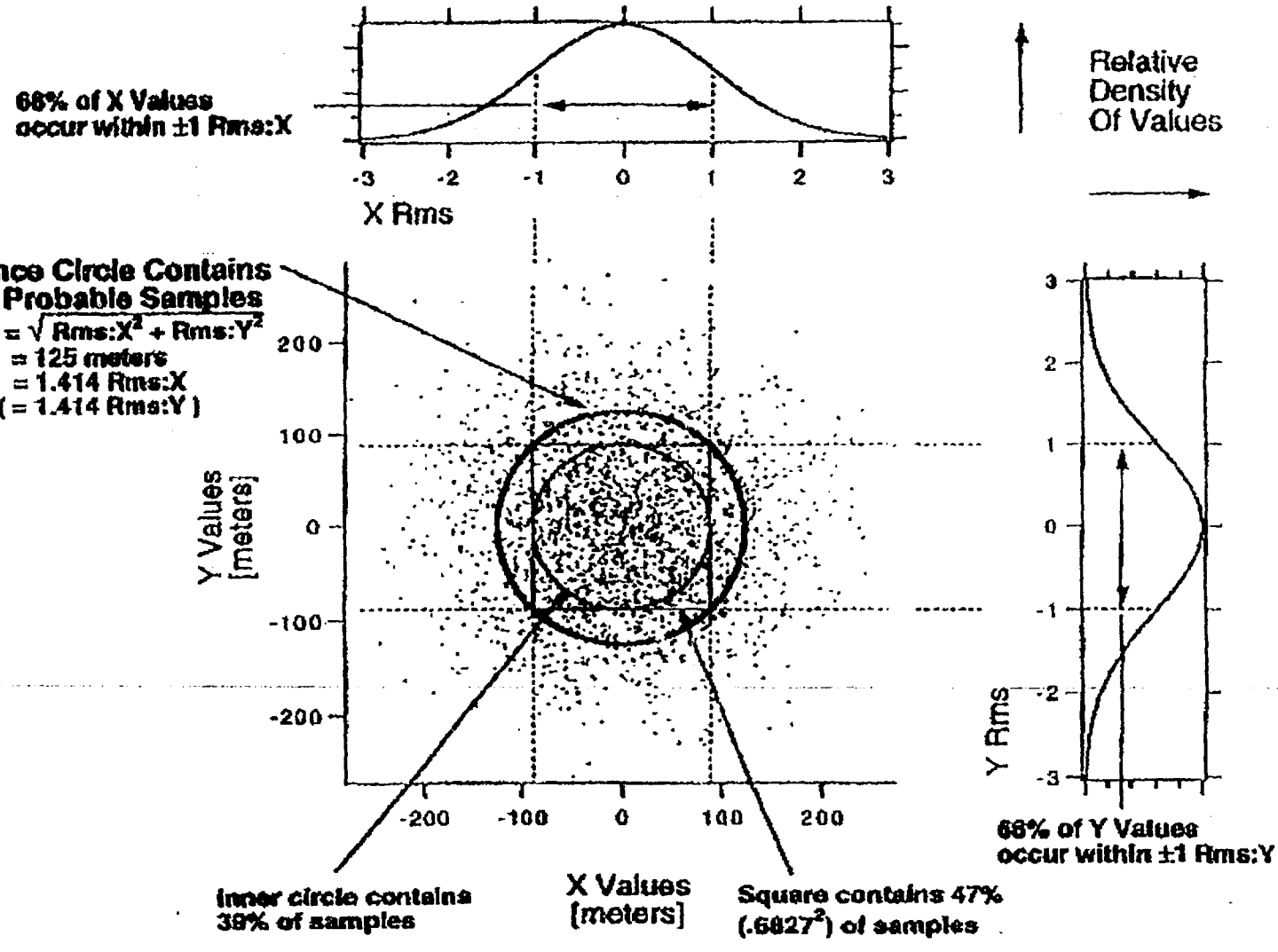
TWO-DIMENSIONAL, NORMAL PROBABILITIES
When Rms:Y = Rms:X



Statistical Percentages

KSI has always supported the adoption of statistical percentages for the specification of localization-accuracy requirements

- Jan 09, 95 — NPRM Comments
- Mar 17, 95 — NPRM Reply Comments**
- Feb 13, 96 — Consensus Agreement (CA) Notice*
- Mar 04, 96 — CA Additional Comments
- Mar 08, 96 — CA Reply Comments*
- Sep 25, 96 — FNPRM Comments
- Oct 08, 96 — Opposition to "Reconsider." Petitions

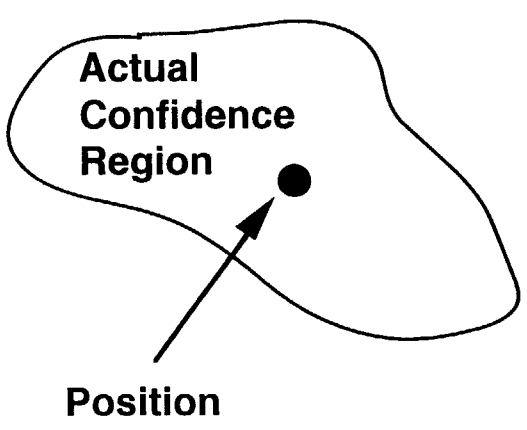
Final-Phase Location Requirements

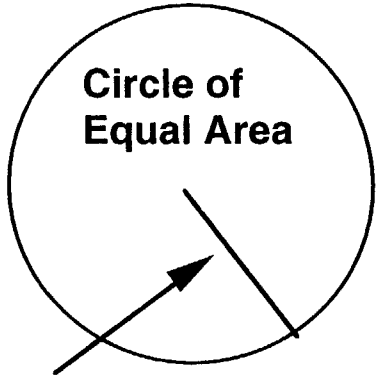
(Location Information:)

.. the mobile station location information shall consist of a *two-dimensional position*, together with a measure of the 90% *confidence region* for that position, where the area of the confidence region may be characterized as a circle with radius less than 125 meters in urban centers and less than 1000 meters in rural environments.

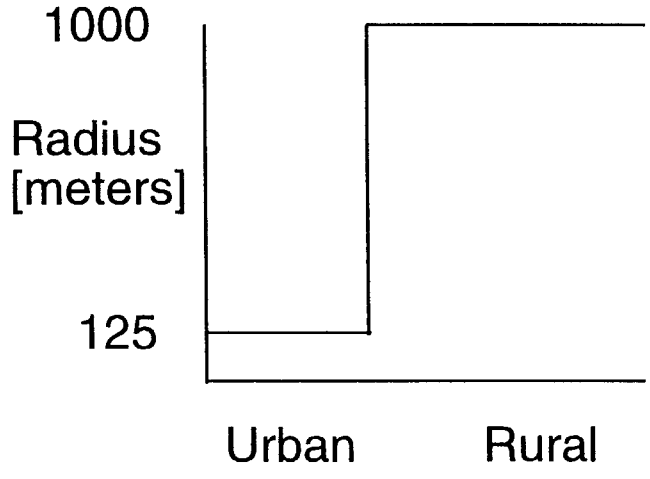
(Time Late:)

The location information shall be provided within 5 seconds of the forwarding of the call to the PSAP.





Radius: Urban 125 m
Rural 1000 m



Scatter Plot of Stationary Locations
(Control Channel)

CBP0118
smaj = 12 m
smin = 5 m
Cbconf = 0.7 deg
Sbconf = 0.7 deg

CHS0119
smaj = 35 m
smin = 10 m
Cbconf = 1.4 deg
Sbconf = 1.6 deg

CBS0118
smaj = 39 m
smin = 7 m
Cbconf = 1.3 deg
Sbconf = 1.3 deg

Air Survey Corporation Photo

CBQ1228
smaj = 29 m
smin = 16 m
Cbconf = 1.7 deg
Sbconf = 1.2 deg

CHC0127
smaj = 30 m
smin = 15 m
Cbconf = 1.6 deg
Sbconf = 2.9 deg

0.8 mile

Scatter Plot of Stationary Locations
(Voice Channel)

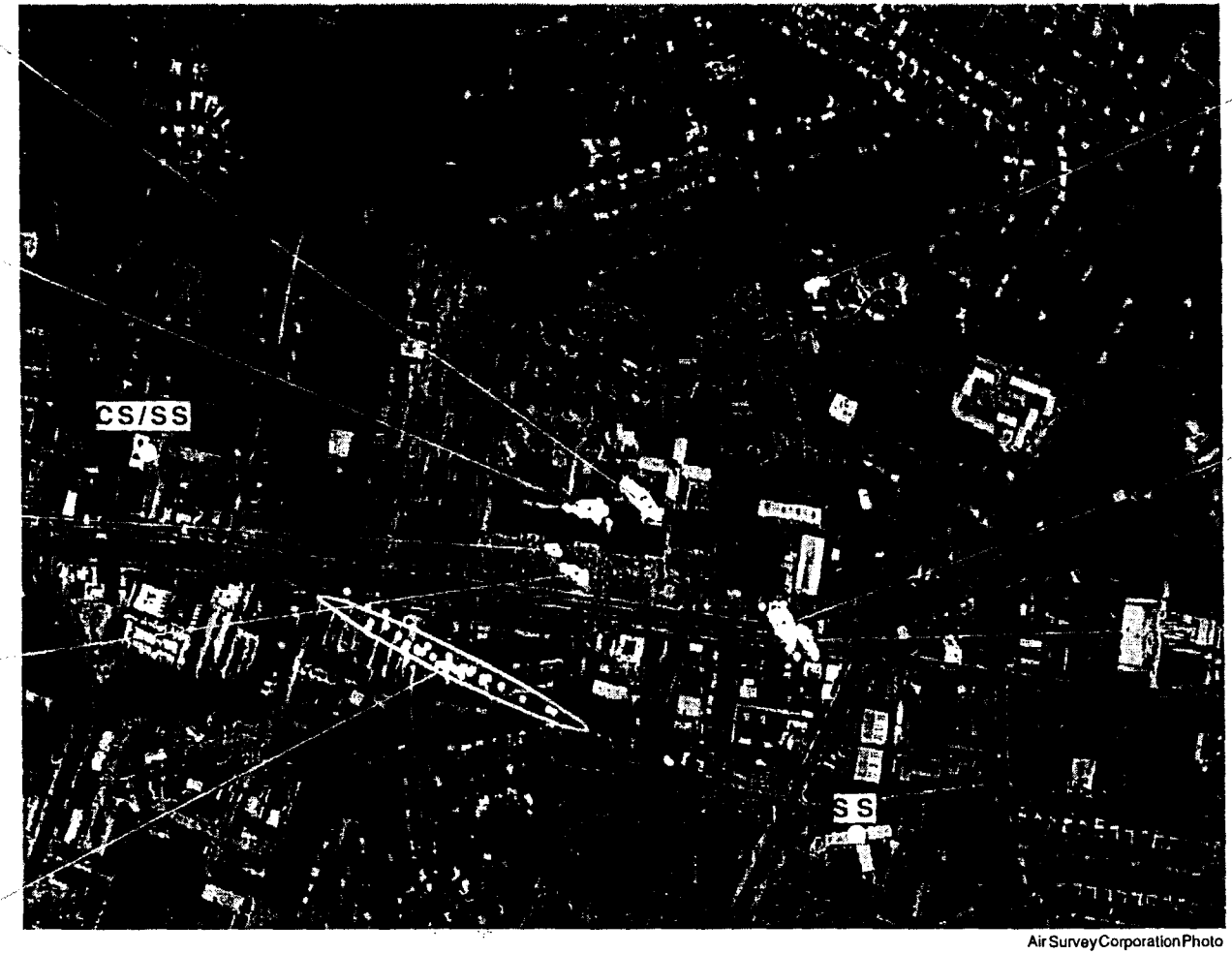
VBP0112B
smaj = 37 m
smin = 10 m
Cbconf = 2.2 deg
Sbconf = 1.2 deg

VHP0118
smaj = 23 m
smin = 9 m
Cbconf = 0.9 deg
Sbconf = 1.8 deg

VHS0127
smaj = 7 m
smin = 2 m
Cbconf = 0.3 deg
Sbconf = 0.3 deg

VBS0118
smaj = 16 m
smin = 4 m
Cbconf = 0.5 deg
Sbconf = 0.7 deg

VBM0119
smaj = 207 m
smin = 17 m
Cbconf = 4.0 deg
Sbconf = 2.0 deg



Air Survey Corporation Photo

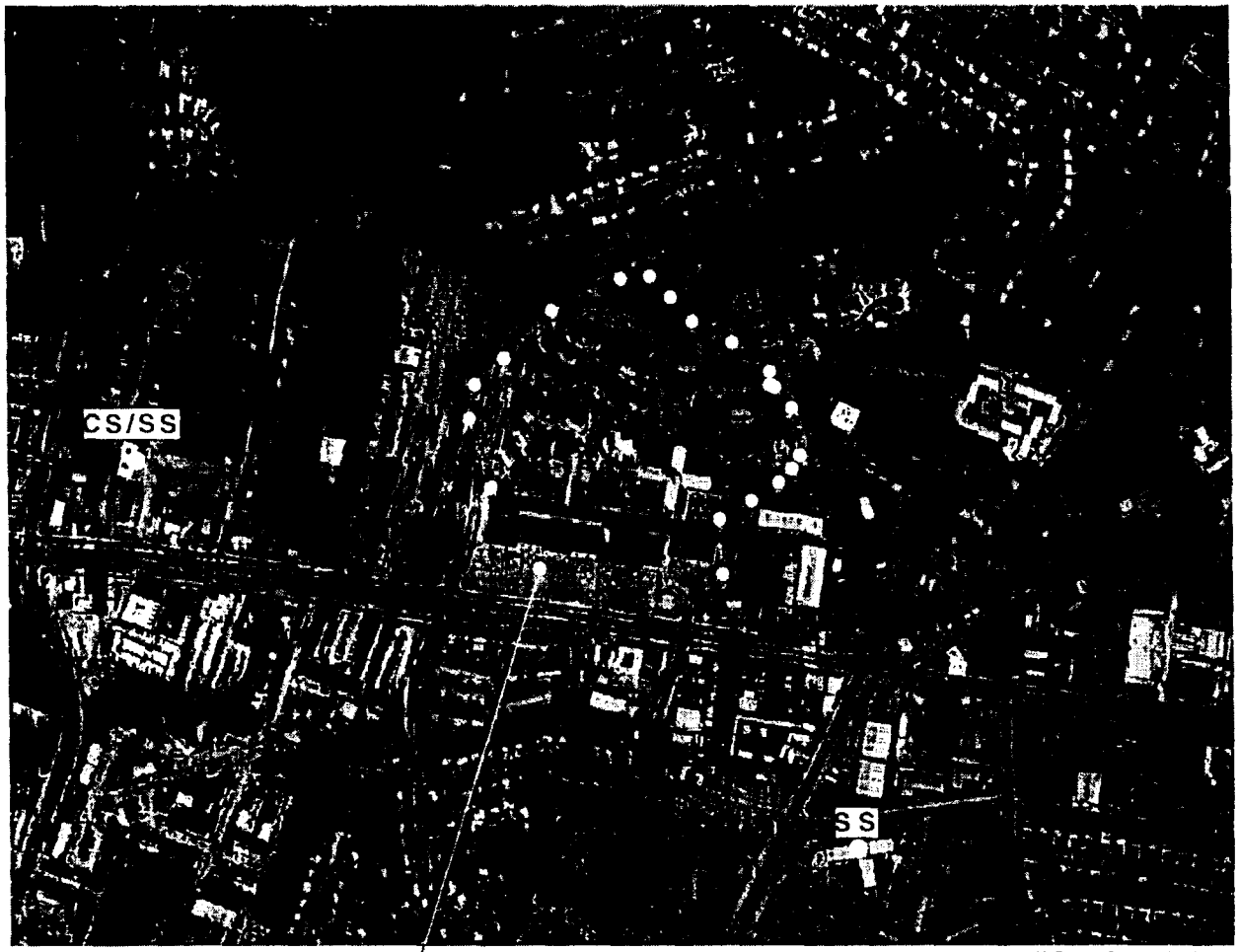
VBQ0118
smaj = 14 m
smin = 2 m
Cbconf = 0.1 deg
Sbconf = 1.1 deg

VHC0127
smaj = 30 m
smin = 11 m
Cbconf = 1.5 deg
Sbconf = 2.4 deg

VBC0127
smaj = 23 m
smin = 4 m
Cbconf = 1.0 deg
Sbconf = 1.6 deg

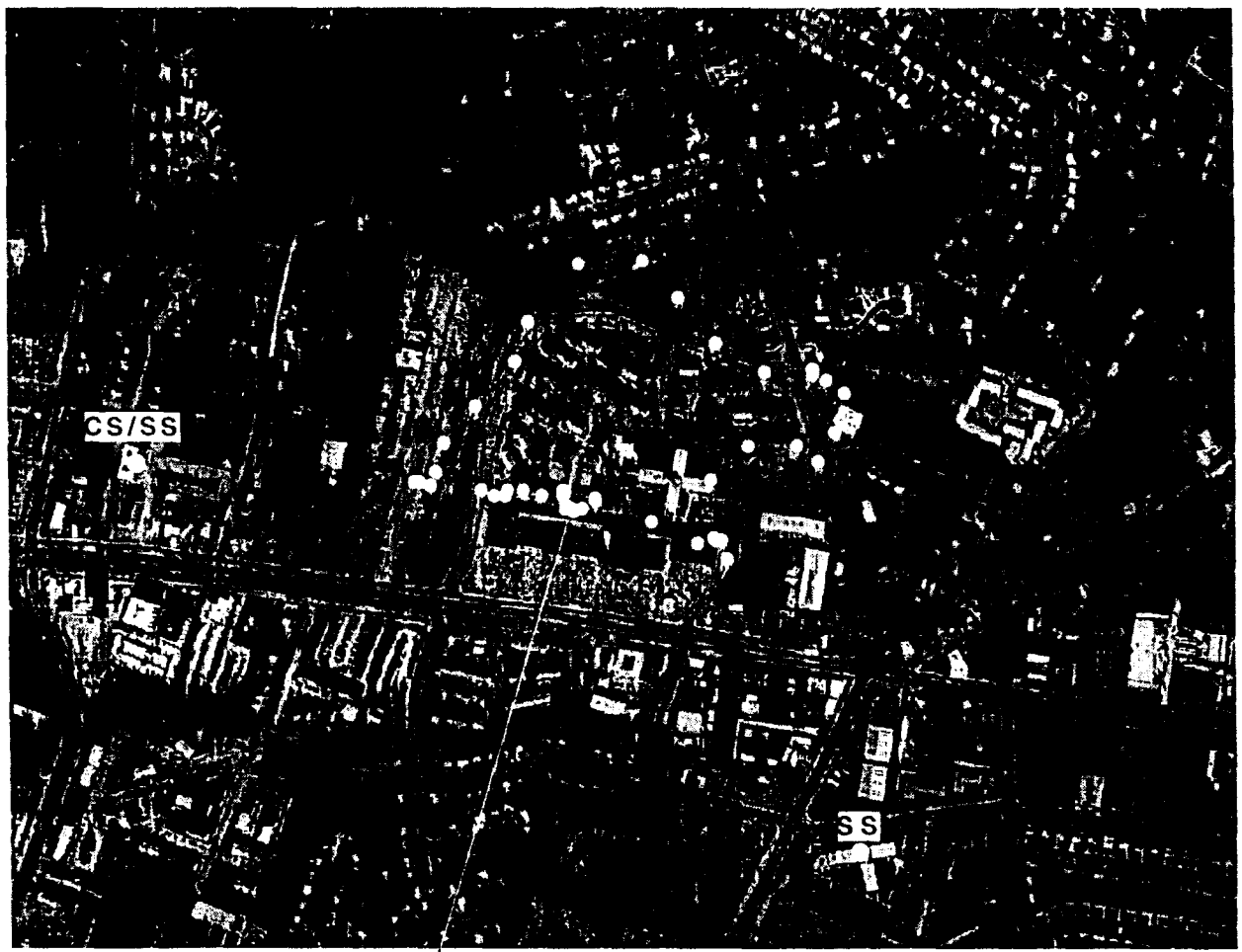
0.8 mile

Scatter Plot of Vehicle Track Locations
(Voice Ch./3 Watt Phone/Clear & Calm)



Air Survey Corporation Photo

Scatter Plot of Vehicle Track Locations
(Voice Ch./0 .6 Watt Phone/Clear & Calm)



Air Survey Corporation Photo

RMS &Percentage Examples

** NPRM Reply Comments: Figures 1 & 2

- All ellipses shown are for 86% probability of containment (smaj and smin @ 2 s.d.)
- Statistical definition (relative to mean):

$$RMS = 0.5\ sqrt(\ smaj^2 + smin^2\ )$$

	RMS		RMS
CBP0118	7 m	VBP0112B	19 m
CHS0119	18 m	VHP0118	12 m
CGS0118	20 m	VHS0127	4 m
CBQ1228	17 m	VBS0118	8 m
CHC0127	17 m	VBM0119	104 m
		VBQ0118	7 m
		VHC0127	16 m
		VBC0127	12 m

Clarification Issues

- **Percentages have multiple possible interpretations**
  - E.g., Averages over:
    - Repeated locations at "same" place and time
    - Different places in a CMRS operational area
    - Different times of day, month, season, or year
    - Other differing call circumstances
- **"Urban" and "Rural" differences**
  - Definitions: e.g., FNPRM Comments at 4

Performance Verification

- **Localization-and-Tracking (L&T) System performance verification is typically accomplished with a combination of "controlled-test" measurements and validated performance-model calculations**
  - **Detailed specification of particular requirements for verification methods is premature**